Health Care Delivery

Does a Helicopter Service Stimulate Financially Motivated Transfers?

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Injured patients transferred to a trauma center from emergency departments and inpatient hospital units by a new helicopter transport service were studied to determine if this new service stimulated financially motivated transfers.

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The initiation of a hospital-based helicopter service may increase the number of patients transferred to a trauma center both from within the local area and from a greater distance away.[1] During the planning of a helicopter service at University Medical Center (UMC), Sacramento, California, hospital administrators expressed concern that the new service might be used to selectively transfer patients who would be unable to pay for their care, a practice sometimes referred to as dumping.[2] To address these concerns, a study was initiated to determine whether helicopter transport increased financially motivated transfers from community hospitals. It was anticipated that most patients would be victims of trauma and, therefore, this group was selected for investigation.

Patients and Methods

All trauma patients transported to UMC from an emergency department or hospital inpatient service by helicopter during the first year of operation were studied. Patients were either admitted to the trauma, neurosurgical or orthopedic services or were discharged from the emergency department. Burn service patients were excluded because a stable referral pattern based on explicit indications for transfer existed.

UMC is the trauma center for the County of Sacramento and is a regional referral source for a large part of northern California and the Central Valley. During the study period no trauma patients were refused transfer.

Two of us, one the chief flight nurse (R.J.O.) and one a physician (K.J.R.), classified the patients into one of two groups: those whose transfer was helicopter-dependent—that is, because of the new helicopter service; and those whose transfer was independent of the helicopter service. This classification was done without knowledge of the charges or collections, and simple decision criteria were used (shown in Figure 1). Patients were first divided into two groups: patients who likely would have been transferred to UMC based on previous referral patterns (old referrals); and patients who previously would not have been transferred to UMC (new referrals). In marginal cases the patient transfer was considered an old referral. Old referrals were considered helicopter-dependent only if the clinical situation would have precluded transfer by any other means, such as the transfer of a patient directly from an operating room. New referrals were considered helicopter-dependent unless it appeared that the helicopter service played no significant role in the decision to transfer the patient, such as a helicopter being used rather than a ground transport on the suggestion of a UMC physician.

Total charges, including both hospital and helicopter charges, and total collections were abstracted from the hospital information system. All accounts had been active for more than eight months. χ^2 Analysis was used to test for dependence between categoric variables and referral type. This included the location of pickup (emergency department or inpatient unit), type of insurance (government sponsored, private insurance, no insurance, contracted services) and diagnostic group (multiple trauma, primarily neurosurgical injury, spinal cord injury, primarily orthopedic injury). The Trauma Score,[3] total charges, total collections and the collection:charge ratio were compared using both analysis of variance and the Kruskal-Wallis test. In all cases statistical significance was chosen to be $< .05$.

Results

A total of 98 injured patients was transferred by helicopter from emergency departments or inpatient hospital services to UMC during the study period. Of these, 57 patients (58%) were classified as helicopter-independent and 41 (42%) as helicopter-dependent. A total of 79 of the patients (81%) were transferred from an emergency department and 19 (19%) from an inpatient hospital service. A frequency diagram of patients by diagnostic groups and insurance carrier is given in Table 1. The helicopter-independent and -dependent groups were not significantly different with regard to location of pickup, diagnostic group or type of insurance.

The average Trauma Score on arrival at UMC was 13.4 for both the helicopter-independent and the helicopter-dependent patients. The average age was 28 years for the helicopter-independent patients and 30 years for the helicopter-dependent patients. For the helicopter-independent group, the average hospital bill was $34,360, the average collection was

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$26,174 and the ratio of collections to charges was 0.760. For the helicopter-dependent group the average hospital bill was $30,199, the average collection was $23,907 and the ratio of collections to charges was 0.794 (Table 1). The ratio of collections to charges was 0.768 for emergency department transfers and 0.799 for inpatient transfers. These two groups were not significantly different in any of the variables using either a one-way analysis of variances or a Kruskal-Wallis test.

Discussion

Initiating a helicopter emergency medical service is an expensive undertaking for any hospital because of both the direct costs of the program and the indirect costs to the hospital in terms of the additional resources required to care for the patients brought to the hospital by helicopter. Recent evidence from California suggests that the care of motor-vehicle accident victims is a break-even proposition with a percentage collection of 80.3%.[4] Several reports in the medical literature have voiced concerns about financially motivated transfers.[5-7] These reports raise legitimate fears that a new aeromedical service might be used to selectively transfer patients not able to pay for the costs of their care.

To study this issue one might simply ask referring physicians whether financial factors influenced their decision to transfer a patient. Even if complete honesty could be relied on, however, the actual weighing of factors that produced the referral would be impossible to quantify in a consistent manner. We chose instead to compare a control group—helicopter-independent patients—with a group of patients thought to be transferred because of the new aeromedical service—helicopter-dependent patients. Both groups comprised a similar proportion of multiple trauma and head-injured patients whose severity of injury was significant and similar. A Trauma Score[3] was used to control for case-mix severity because it is widely accepted, extensively validated and sensitive to the physiologic state of the patient. An indirect measure of severity of injury, the hospital resources required to care for patients as measured by the total hospital charges, was similar as well. Measures of potential and actual payment, insurance type, total collections and the ratio of collections to charges were not significantly different. The similar clinical and financial profiles of the two groups suggest that patients thought to be transferred because of the new aeromedical service were referred for similar reasons as for the control group. We therefore concluded that the aeromedical service did not stimulate financially motivated transfers.

TABLE 1.—*Helicopter-Transferred Patients, by Diagnostic Group and Type of Insurance*

	Helicopter-independent N = 57	*Helicopter-dependent* N = 41
Diagnostic Groups		
Multiple trauma	26	23
Neurosurgical	25	14
Spinal cord	3	1
Orthopedic	3	3
Type of Insurance		
Government	16	11
Private	28	26
No insurance	5	2
Contract	8	2
Clinical Information		
Trauma Score*	13.4	13.4
Age, years*	28	30
Financial Profile		
Charges*	$34,360	$30,199
Collections*	$26,174	$23,907
Charges/collections*	0.760	0.794

*Numbers represent average for the group. No statistically significant difference between groups.

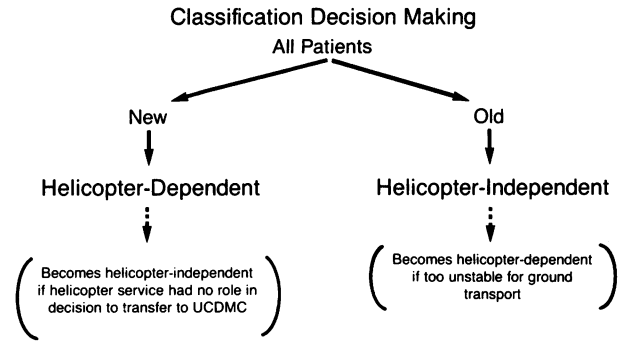

Figure 1.—The method of classifying patients into helicopter-dependent and helicopter-independent groups.

This information might be viewed from two different perspectives. From a hospital administrator's point of view, the main question to be answered is what the financial impact of helicopter-dependent patients is on the hospital. Analysis of variance addresses this question. At UMC, helicopter-dependent patients paid a higher percentage of charges than did helicopter-independent patients, although this did not reach statistical significance. One or two patients with very large bills could dramatically change this picture.

From the point of view of a policymaker, the question to be answered is whether physicians systematically transfer patients based on ability to pay. This did not seem to occur in the new UMC referral network. The type of insurance coverage was similar in the helicopter-dependent and -independent groups, suggesting that there was no intent to transfer underinsured patients selectively. Furthermore, analyses of charges, collections and individual collection:charge ratios using the Kruskal-Wallis test suggest no differences between the helicopter-independent and -dependent groups. The Kruskal-Wallis test is a nonparametric method of analysis in which the rank order rather than the specific numeric values is analyzed. In this study, the distribution of patients in the two groups was compared after placing them in rank order based on the monetary values. The Kruskal-Wallis method does not assume that populations possess a normal probability distribution or that the variances are equal. Overall trends are revealed and the impact of very large or very small values is reduced.

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